

## ABSTRACT

Primitive or progenitor hematologic cancer cells have been implicated in the early stages and development of leukemia and malignant lymphoproliferative disorders, including acute myelogenous leukemia (AML), chronic myelogenous leukemia (CML) and chronic lymphoid leukemia (CLL). Interleukin-3 receptor alpha chain (IL-3R $\alpha$  or CD123) is strongly expressed on progenitor hematologic cancer cells, but is virtually undetectable on normal bone marrow cells. The present invention provides methods of impairing progenitor hematologic cancer (e.g., leukemia and lymphomic) cells by selectively targeting cells expressing CD123. These methods are useful in the detection and treatment of leukemias and malignant lymphoproliferative disorders. Also provided are compounds useful for selectively binding to CD123 and impairing progenitor hematologic cancer cells. These compounds may include cytotoxic moieties such as, for example, radioisotopes or chemotherapeutics.